

WORLDWIDE EMERGING ENVIRONMENTAL ISSUES AFFECTING THE U.S. MILITARY
Control No. (TCN) 08152 with Battelle Chapel Hill Operations for the U.S. Army Environmental Policy Institute

JUNE 2010 REPORT

Note to Readers: Pages 1-11 comprise the summary and analysis of this report. Expanded details for some items are in the Appendix beginning on page 12.

Item 1. NASA Scientist Warns of Possible Severe Solar EMPs in 2013.....	1
Item 2. OSCE is Enhancing Environmental Security in Central Asia.....	1
Item 3. G8 and G20 Integrate Security and Environmental Issues in Development.....	2
Item 4. Preparations for a Legally Binding Global Instrument on Mercury Advance.....	2
Item 5. Technological Advances with Environmental Security Implications.....	3
5.1 Elements of Prototype Tsunami Prediction System Tested.....	3
5.2 New Detection and Cleanup Techniques.....	3
5.3. Increasing Energy Efficiency Technologies.....	4
Item 6. Updates on Previously Identified Issues.....	5
6.1 International Renewable Energy Agency Statute Enters into Force on 8 July 2010.....	5
6.2 International Body to Monitor Biodiversity Destruction.....	5
6.3 The Race for Natural Resources a Potential Impediment for Peace.....	6
6.4 EU Expert Group Suggests Action to Secure 14 Critical Raw Materials.....	6
6.5 British Group Outlines Plan for Zero Emissions by 2030.....	7
6.6 Energy Security Central to China's Energy Plan.....	7
6.7 Study Shows Deforestation Brings Malaria Epidemics.....	7
6.8 Increasing Advocacy for BPA Restrictions.....	8
6.9 Toxic Substances Control Act Up for Revision.....	8
6.10 Climate Change.....	9
6.10.1 Scientific Evidence and Natural Disasters.....	9
6.10.2 Food and Water Security.....	9
6.10.3 Computer Modeling.....	9
6.10.4 Adaptation.....	10
6.10.5 Post-Copenhagen Negotiations.....	10
6.11 Nanotechnology Safety Issues.....	11
Appendix.....	12

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Item 1. NASA Scientist Warns of Possible Severe Solar EMPs in 2013

Dr Richard Fisher, the director of NASA's Heliophysics Division, has warned in an interview that the coincidence of the sun's magnetic energy and sunspot cycles in 2013 could produce devastating electromagnetic pulses (EMPs), disabling large portions of the electricity grid. The National Academy of Sciences made a similar forecast two years ago.

Military Implications:

If large portions of the electric grids around the world did go down, then there are potentials for large-scale social disruptions. What is the military's role in helping to provide coherence of response in situations without a clear line of command among police, NGOs, UN agencies, and local governments? A review of lessons learned in previous large-scale human disasters should be applied to alternative scenarios and simulations to prepare for these solar impacts. The military should review its protective arrangements against EMPs in the light of this forecast.

Source:

NASA warns solar flares from 'huge space storm' will cause devastation

<http://www.telegraph.co.uk/science/space/7819201/Nasa-warns-solar-flares-from-huge-space-storm-will-cause-devastation.html>

Item 2. OSCE is Enhancing Environmental Security in Central Asia

The OSCE continued its commitment to further environmental security in Central Asia during a meeting held June 23, 2010, among the OSCE Chairperson-in-Office, Kazakhstan's Secretary of State and Foreign Minister Kanat Saudabayev, President of Turkmenistan Gurbanguly Berdymukhammedov, and other senior officials. In addition to exploring ways to improve environmental security in the region, they also discussed the related security issues in Kyrgyzstan and Afghanistan. Following the meetings Saudabayev said: "The Kazakh OSCE Chairmanship is committed to preventing escalation of tensions in Kyrgyzstan, and is ready to help the country with post-conflict rehabilitation. The OSCE is working together with the international community to help Kyrgyzstan." The next day's high-level international conference on disarmament in Central Asia and the Caspian region, held also under the auspices of the OSCE, expanded the discussions to potential strategies for making Central Asia a zone free of weapons of mass destruction (including nuclear), strengthening nuclear security in Central Asian states (counter transit of nuclear materials by terrorists), safe transportation of energy resources, and the Caspian Sea border delimitation disputes. These issues will be further discussed at an informal meeting of OSCE Foreign Ministers in Almaty, July 16-17, 2010. [Related items: *First EU-Central Asia Security Forum Included Environmental Security* in September 2008, *ENVSEC to Expand Environmental Co-operation in South Caucasus*, in March 2009 environmental security reports.]

Military Implications:

Relevant military personnel with environmental security responsibilities in the region should contact the government of Turkmenistan and OSCE to explore any new developments from these meetings, and their implications for military-to-military cooperation in the region.

Sources:

OSCE Chairperson welcomes Turkmenistan's role in promoting stability in Central Asia

http://www.osce.org/cio/item_1_44791.html

Turkmenistan Weekly Roundup

<http://www.eurasianet.org/node/61437>

Item 3. G8 and G20 Integrate Security and Environmental Issues in Development

The G8 meeting held in Muskoka, Canada, declared that: "We must also ensure that the proliferation of weapons of mass destruction, terrorism and organized crime, as well as many other challenges faced by states to address their security vulnerabilities, including climate change, remain at the forefront of public policy." The G8 reiterated the goal of reducing global greenhouse gas emissions at least 50% by 2050, with developed countries reducing in aggregate by at least 80% compared to 1990 or more recent years.

The G8 was followed by the first Summit of the G20 in its capacity as the premier forum for international economic cooperation. The G20 addressed cooperation strategies for finding global solutions to transnational problems, such as the effects of climate change, food and energy security. A Working Group on Development was established to suggest a development strategy to be adopted at the Seoul Summit to be held November 11-12, 2010. However, critics say that the Toronto Declaration was watered down, not containing specific commitments to clean energy and phase-out subsidies of fossil fuels.

Military Implications:

The meetings reinforced the need for international cooperation and integration of global strategies for security, development, and the environment. The military should build on the results of the G8 and G20 meetings to further its international cooperation on environmental sustainability and security, and promote the Army Strategy for the Environment.

Sources:

G8 Muskoka Declaration Recovery and New Beginnings

<http://g8.gc.ca/g8-summit/summit-documents/g8-muskoka-declaration-recovery-and-new-beginnings/>

G-20 Summit website

<http://g20.gc.ca/toronto-summit>

The Toronto Declaration

http://www.g20.org/Documents/g20_declaration_en.pdf

G20 summit drops clean-energy pledge

<http://www.earthtimes.org/articles/news/331848,summit-drops-clean-energy-pledge.html>

Item 4. Preparations for a Legally Binding Global Instrument on Mercury Advance

The First Meeting of the Intergovernmental Negotiating Committee to Prepare a Global Legally Binding Instrument on Mercury was held from June 7-11, 2010 in Stockholm, Sweden, attended by over 400 participants, representing governments, UN agencies, and intergovernmental and non-governmental organizations. This first meeting consisted of initial exchanges of views on key elements of a convention, with the most important outcome being the request to the Secretariat for significant intersessional work, including the "elements of a comprehensive and suitable approach" to a legally binding instrument, which will be a basis for negotiations at the

next meeting to be held January 24-28, 2011, in Chiba, Japan. [Related items: *UNEP Conference Further Environmental Governance* in February 2009, and *EU Legislation Banning Mercury Exports in Effect in 2011* in October 2008 environmental security reports.]

Military Implications:

The military should assess which areas would be affected by a global ban on mercury and prepare for substitutes.

Sources:

First Session of the Intergovernmental Negotiating Committee to Prepare a Global Legally Binding Instrument on Mercury (INC1)

<http://www.iisd.ca/mercury/inc1/>

Item 5. Technological Advances with Environmental Security Implications

5.1 Elements of Prototype Tsunami Prediction System Tested

Reportedly, a team from NASA's Jet Propulsion Laboratory in Pasadena CA has "successfully demonstrated for the first time elements of a prototype tsunami prediction system that quickly and accurately assesses large earthquakes and estimates the size of resulting tsunamis." A key element in the new system's performance is its taking into account the characteristics of the continental shelf near the epicenter.

Military Implications:

The military should follow the development of this capability in order to be prepared to apply it to measures for the protection of coastal military installations from tsunami damage.

Source:

NASA Demonstrates Tsunami Prediction System

<http://www.physorg.com/news195755113.html>

5.2 New Detection and Cleanup Techniques

5.2.1 New Catalyst Removes Nitrite and Nitrate from Drinking Water

Jitendra Kumar Chinthaginjala of the University of Twente, Netherlands, has developed a catalyst structure that can efficiently remove hazardous nitrite and nitrate, in combination with hydrogen, from drinking water, and turn it into harmless nitrogen. The system consists of nanoparticles of palladium or platinum attached to extremely fine threads of carbon, with the spaces between the threads allowing the nitrite and nitrate to come into good contact with the surface of the nanoparticles.

Military Implications:

The military should evaluate this technique for its usefulness in cleanup of contaminated water supplies.

Source:

University of Twente Develops Catalysts For Clean Drinking Water

<http://www.utwente.nl/news/ut-ontwikkelt-katalysatoren-voor-schoon-drinkwater>

5.2.2 Silicon-on-insulator Microring Resonator Provides High Sensitivity Gas Detection

According to an article in *Nanowerk News*, INTEC, imec's associated laboratory at Ghent University in Belgium, has developed a technique using coated SOI microring resonators with films of 3.5 nm ZnO nanocrystals to achieve optical sensing of gaseous ethanol. Ethanol vapor concentrations as low as 100 ppm have been detected. The devices can be modified for the detection of other gases.

Military Implications:

The military should follow this development for its applicability to high performance environment sensing systems.

Source:

Optical ethanol vapor sensor shows potential of SOI-based integrated gas sensors
<http://www.nanowerk.com/news/newsid=16809.php>

5.3. Increasing Energy Efficiency Technologies

5.3.1 Nanowire Solar Cells Have Prospect of Higher Efficiency

Researchers at the Eindhoven University of Technology in the Netherlands are working on nanowire-based solar cells, which, when combined with proper mirror systems, might reach an efficiency as high as 65%, at a cost of less than \$0.50/watt.

Military Implications:

The military should follow this development as a possible environment-sparing component for future power supply systems.

Source:

Towards nanowire solar cells with a 65-percent efficiency
http://w3.tue.nl/en/services/daz/alumni/news/news_article/?tx_ttnews%5Btt_news%5D=9746&tx_ttnews%5BbackPid%5D=12152&cHash=8c268b0fcf

5.3.2 Solar-chargeable Lamp Provides Low-Cost Illumination

A group of scientists from the Risø National Laboratory for Sustainable Energy, in Denmark, has developed a low-cost (perhaps about \$4) plastic lamp, rechargeable from the sun.

Military Implications:

The military should consider this technology as a way of providing low-cost illumination.

Sources:

Low-cost solar solution could empower off-grid poor

<http://www.scidev.net/en/news/low-cost-solar-solution-could-empower-off-grid-poor.html>

Manufacture, integration and demonstration of polymer solar cells in a lamp for the Lighting Africa initiative

<http://www.rsc.org/Publishing/Journals/EE/article.asp?doi=b918441d>

Item 6. Updates on Previously Identified Issues

6.1 International Renewable Energy Agency Statute Enters into Force on 8 July 2010

The International Renewable Energy Agency (IRENA) Statute has received its 25th ratification and therefore IRENA will become a full-fledged international organization on 8 July 2010. Helen Pelosse, IRENA Interim Director General, underlined that IRENA's ratification process was the fastest ever for such a process. IRENA's objective is to promote a swift transition towards sustainable use of renewable energy. By the end of June 2010, a total of 144 countries and the European Union have signed IRENA's mandate, and 26 countries have ratified it. [Related item: *New International Renewable Energy Agency Opens in January*, in December 2008 environmental security report]

Military Implications:

[Same as previous on this issue] Military personnel seeking to implement the Army Strategy for the Environment and others responsible to further convert to renewable energy systems should explore potential relations with IRENA. Although its mandate is primarily consulting on renewable energy technology, it is reasonable to assume that IRENA will also address policy and regulatory issue for global energy security.

Source:

IRENA's statute enters into force

http://www.irena.org/news/Description.aspx?News_ID=19&mnu=nws

6.2 International Body to Monitor Biodiversity Destruction

The Intergovernmental Science Policy Platform on Biodiversity and Ecosystem Services (IPBES) will be an international body to monitor and curb the destruction of biodiversity. It is modeled on the Intergovernmental Panel on Climate Change (IPCC), which helped raise climate change on the international and national agendas and trigger changes. The establishment of the new body was agreed to by governments meeting in Busan, South Korea, and has to be approved by the UN General Assembly's 65th session, which opens in September, and then presented for endorsement by environment ministers attending the UNEP Governing Council/Global Ministerial scheduled to be held in February 2011, in Nairobi, Kenya. [Related item: *New Mechanisms for Enforcing Biosafety and Biological Diversity Treaties* in May 2008 environmental security report.]

Meantime, UNEP released the first issue in its new Policy Series on Ecosystem Management, "Integrated Solutions for Biodiversity, Climate Change and Poverty." It highlights, *inter alia*, the importance of biodiversity in adaptation to climate change and the need for a new strategy to increase engagement of business leaders to improve biodiversity protection.

Military Implications:

The military should be prepared to comply with potential new requirements and reporting, as well as new measures for protecting biodiversity.

Sources:

Governments Give Green Light to International Body on Biodiversity

<http://ictsd.org/i/news/biores/77860/>

Summary of the third ad hoc intergovernmental and multi-stakeholder meeting on an intergovernmental science-policy platform on biodiversity and ecosystem services 7-11 June 2010

<http://www.iisd.ca/ymb/biodiv/ipbes3/html/ymbvol158num11e.html>

Integrated Solutions for Biodiversity, Climate Change and Poverty--UNEP Press Release:
<http://www.unep.org/ecosystemmanagement/Policy/UNEPPOLICYSERIESBLOG/tabcid/4564/language/en-US/Default.aspx>

Integrated Solutions for Biodiversity, Climate Change and Poverty--The Policy Brief
http://www.unep.org/policyseries/Sustainable_intergrated_Solutions.pdf

6.3 The Race for Natural Resources a Potential Impediment for Peace

Afghanistan's natural resources have become more prominent in the media due to the recent discovery of previously unknown mineral deposits, such as copper, iron ore, lithium, and gold. However, concerns increase that the race for rare minerals could exacerbate conflict in vulnerable countries rich in those resources, such as the current case in the Congo. [Related item: *Monopoly over Rare Earth Elements Raises Security and Environmental Concerns* in January 2010 environmental security report.]

Military Implications:

The discovery of new minerals coupled with the current instability in Afghanistan could increase conflict in the region. The coalition forces should explore additional efforts to work with the Afghan government to improve its capability to withstand conflict over the control of mineral wealth.

Sources:

World's Mining Companies Covet Afghan Riches

<http://www.nytimes.com/2010/06/18/world/asia/18mines.html?ref=world>

Next for Afghanistan, the Curse of Plenty?

<http://www.nytimes.com/2010/06/20/weekinreview/20mcneil.html>

Death by Gadget

<http://www.nytimes.com/2010/06/27/opinion/27kristof.html>

6.4 EU Expert Group Suggests Action to Secure 14 Critical Raw Materials

An EU expert group has presented a final report identifying 14 raw materials as "critical" for EU industries, and suggesting that the EU take diplomatic steps to ensure that its companies gain easier access to them in the future. The 14 materials are antimony, beryllium, cobalt, fluorspar, gallium, germanium, graphite, indium, magnesium, niobium, platinum group metals, rare earths, tantalum and tungsten.

Military Implications:

The military should take the European effort into account in its own activities in this area of rare resource availability.

Sources:

Defining critical raw materials

http://ec.europa.eu/enterprise/policies/raw-materials/critical/index_en.htm

Meridian Nanotechnology and Development News 6/18

<http://www.merid.org/nanodev/more.php?articleID=2691>

EU to step up raw materials 'diplomacy'

<http://www.euractiv.com/en/sustainability/eu-step-up-raw-materials-diplomacy-news-495397>

6.5 British Group Outlines Plan for Zero Emissions by 2030

The Centre of Alternative Technology (CAT) in Wales has outlined a series of measures that could be taken to bring UK emissions down to zero by 2030. They involve a combination of electrification, insulation, and a massive scaling up of offshore wind.

Military Implications:

Military personnel concerned with emission reduction policies and plans should review this plan for useful ideas.

Sources:

ZeroCarbonBritain2030

<http://www.zcb2030.org/>

Zero carbon Britain: how to get there in 10 steps

http://www.theecologist.co.uk/News/news_analysis/513525/zero_carbon_britain_how_to_get_there_in_10_steps.html

6.6 Energy Security Central to China's Energy Plan

Although China is one of the world leaders in renewable energy production, its energy plan is still heavily relying on the more traditional energy sources of fossil fuels. While the benefits of renewable resources do include some relief for environmental issues like climate change, the focus of the Chinese energy plans seems to be energy security. Chinese energy legislation is expected to be approved in the fall.

Military Implications:

According to Victor Chu, a leading commentator on China and Chairman, First Eastern Investment (Hong Kong and London), at the recent World Economic Forum, the energy-environment is the new focus in US-China relations. As a result, military liaisons in China may have new opportunities to seek collaboration with their Chinese counterparts on sustainable energy cooperation.

Sources:

Security Tops the Environment in China's Energy Plan

<http://www.nytimes.com/2010/06/18/business/global/18yuan.html>

Security tops climate in China

<http://www.telegram.com/article/20100620/NEWS/6200594/1002/BUSINESS>

6.7 Study Shows Deforestation Brings Malaria Epidemics

A study based on data collected in Brazil's Amazon forests region revealed a direct link between deforestation and the increasing incidence of malaria. The analysis shows that for the period August 1997-August 2001, a 4.2% change in deforestation can be associated with a 48% increase of malaria incidence.

Military Implications:

The military should consider such findings in planning bases or military operations. Also, the findings might trigger some specific regulations for areas and the ways deforestation is performed (including for potential military bases), not only in the Amazon, but in any malarial region.

Sources:

Olson SH, Gangnon R, Silveira GA, Patz JA. Deforestation and malaria in Mâncio Lima county, Brazil. *Emerg Infect Dis* 2010, 16:1108–15. doi: 10.3201/eid1607.091785

<http://www.cdc.gov/eid/content/16/7/1108.htm>

Cleared forests lead to rise in malaria in Brazil

<http://www.reuters.com/article/idUSTRE65F61720100617>

6.8 Increasing Advocacy for BPA Restrictions

France has adopted legislation banning baby bottles containing bisphenol A (BPA), although the opposition parties demanded a larger spectrum ban. Some other European countries, as well as Canada, have regulations restricting or requiring precautionary use of BPA. In view of an upcoming assessment by the European Food Safety Authority (Efsa), to be published in July, a group of experts (40 organizations and 19 academics) endorsed a letter supporting Efsa's decision to review a larger number of studies addressing potential hazards of BPA use in consumer products, including non-industry-funded papers. Over 130 studies conducted in the past ten years revealed that even low levels of BPA could cause serious health problems.

[Related item: *Concerns Increasing for BPA Bans and Phthalates* in October 2008 environmental; security report.]

Military Implications:

The military should review the adequacy of its logistical provisions for the possible future ban or restriction of products containing BPA. Also, as a precaution, it should consider reducing the use of BPA-containing products.

Source:

A group of 60 scientists backed by environmental, health

<http://www.independent.co.uk/news/science/use-of-bpa-must-be-limited-say-scientists-2007841.html>

French lawmakers ban baby bottle chemical

<http://www.physorg.com/news196513736.html>

6.9 Toxic Substances Control Act Up for Revision

The Safe Chemicals Act of 2010 has been introduced in Congress to replace the Toxic Substances Control Act of 1976. The new law would include size, size distribution, shape, and surface structure in the definition of a chemical's "substance characteristic", raising the question of the effect new provisions would have on products containing nanomaterials.

Military Implications:

The military should follow the legislative course of this measure for possible effects on military procurement.

Source:

Taking the NanoPulse -- Toxic Substance Meets Poison Thinking

http://www.industryweek.com/articles/taking_the_nanopulse__toxic_substance_meets_poison_thinking_22034.aspx?Page=2>ShowAll=1

6.10 Climate Change

6.10.1 Scientific Evidence and Natural Disasters

May 2010 was the 303rd consecutive month that was hotter than the 20th century global average for that month, according to NOAA's National Climatic Data Center. The combined global land and ocean surface temperature for May was 59.84°F (15.46°C), which was 1.24°F (0.69°C) above the 20th century average of 58.6°F (14.8°C).

The Web-based climate policy assessment system 'Climate Action Tracker' (www.climateactiontracker.org) shows that present developments and actions pledged globally "give virtually no chance to limit global mean temperature increase to below 2°C by the end of the century. ...[and] give us a virtual certainty of exceeding 1.5°C, with global warming very likely exceeding 2°C and a more than 50% chance of exceeding 3°C by 2100"

6.10.2 Food and Water Security

According to the annual OECD and FAO joint report, food prices might increase drastically over the next ten years, with forecasts for wheat and coarse grain prices to rise between 15% and 40% (in real terms, adjusted for inflation, average levels during the 1997-2006 period—the decade before the price spike of 2007-08); vegetable oils are expected to be more than 40% higher and dairy prices are projected to be 16-45% higher. Much of the increase will be generated by growing demand from emerging markets and for biofuel production.

A 'water security risk index', compiled by British-based risk consultancy Maplecroft, found African and Asian nations had the most vulnerable supplies, judged by factors including access to drinking water, per capita demand and dependence on rivers that first flow through other nations. Somalia, where just 30% of the population has clean drinking water, is in the most precarious situation, followed by Mauritania, Sudan, Niger, Iraq, Uzbekistan, Pakistan, Egypt, Turkmenistan and Syria.

At the High Level International Conference on the Midterm Comprehensive Review of the Implementation of the International Decade for Action "Water for Life" 2005-2015, from 8-10 June 2010, in Dushanbe, Tajikistan, participants reviewed the progress during the first five years. The Dushanbe Declaration on Water, which includes a number of conclusions and recommendations, will be submitted to the UN General Assembly. The review highlights the importance of, among others: building resilience and reducing vulnerabilities to extreme events; enhancing hydrologic, hydrogeologic and meteorological data collection, assessment and dissemination capabilities; and sustained and predictable financial assistance and technology transfer to developing countries.

"Vision 2030: The resilience of water supply and sanitation in the face of climate change" is a collection of papers in preparation released by the WHO together with the UK Department for International Development, including a "full technical report, as well as detailed reports on climate change and technology projections, and a review of resilience and adaptive capacity, including a series of technology-by-technology fact sheets."

6.10.3 Computer Modeling

An International Conference on Post-Kyoto Climate Change Mitigation Modeling gathered about 450 people — experts in modeling as well as students — to introduce developments of greenhouse gas reduction modeling and foster international cooperation and networking for

improving GHG reduction analysis models. It was agreed that the models should factor in new developments in technical innovation, changes in lifestyle, and energy security and energy systems.

Military and security experts participating at a conference organized by the Scripps Institution of Oceanography's new Center for Environment and National Security agreed that the Defense Department has to negotiate directly with climate modelers to get the future forecasts it needs. NOAA's next-generation climate models are expected to incorporate knowledge of the social sciences, agriculture, and marine ecosystems, and highlight not only potential changes, but also which might be the plausible consequences. It was also highlighted that there is a gap between the way scientific data is presented and the real needs of the defense organizations.

6.10.4 Adaptation

The Environment Council of the EU, which met on 11 June 2010 in Luxembourg, adopted conclusions on water scarcity, drought, and adaptation to climate change, as well as on preparing forests for climate change. The Council stressed inter-linkages of water scarcity and drought with climate change adaptation and biodiversity conservation, and the importance of exchanging experience and best practices with other partners. The Council also supported the development of a European drought observatory which is tasked to contribute to drought forecasting, assessment and monitoring as well as to the exchange of best practices on this issue.

The first World Congress on Cities and Adaptation to Climate Change was held May 28-30, 2010, in Bonn, Germany, under the theme "Resilient Cities 2010". During the Congress, the UN Convention to Combat Desertification (UNCCD) and the FAO co-organized a session on "Ensuring food security through adaptation", where participants discussed adaptation approaches for achieving food security including: diversifying and adapting local and traditional food; securing watershed management; and adapting supply-demand linkages for adequate food supply and processing. At the end of the Congress, members of the Mayors Adaptation Forum signed the Bonn Declaration of Mayors. The Declaration recognizes the failure of the UNFCCC COP 15 to deliver a strong and comprehensive post-2012 climate agreement and identifies ten action points, such as to prioritize local level adaptation strategies that support local sustainable development.

6.10.5 Post-Copenhagen Negotiations

The Bonn Climate Change Talks took place between May 31 and June 11, 2010 in Bonn, Germany, attended by approximately 2,900 participants, representing governments, intergovernmental and non-governmental organizations, academia, the private sector and the media. Critics say that not much was achieved for advancing the negotiations for the next phase. The request of the Alliance of Small Island States (AOSIS) and many other parties for a technical paper by the Secretariat on options for limiting global average temperature increase to 1.5°C and 2°C from pre-industrial levels, was opposed by Saudi Arabia, Oman, Kuwait and Qatar. The final text of the meeting mentions that industrialized countries should aim to cut greenhouse gases 25-40% by 2020 but it does not set a year when that comparison should start (scientists say the base line should be 1990, while the United States has argued for 2005.)

Meantime, the IEA reports that fossil fuel consumption subsidies amounted to \$557 billion in 2008, a considerable increase from \$342 billion in 2007. Considering a baseline in which subsidy rates remain unchanged, IEA forecasts and models indicate that phaseout between 2011 and 2020 would need to: cut primary global energy demand by 5.8% by 2020; cut global oil demand by 6.5 mb/d in 2020, predominately in the transport sector; reduce CO₂ emissions by

6.9% by 2020 – or 2.4 GT of CO₂. It notes that both the Copenhagen Accord and the G20 subsidies are important to meet warming targets. If the Copenhagen Accord pledges were fully implemented, then emissions would be reduced by 70% of what is needed to be on track to meet the 2°C target by 2020. Additionally, if the G20 subsidy commitment were to be fully implemented, it would reduce emissions by more than 30% of what is needed to be on track to meet the 2°C target by 2020.

Military Implications:

[Same as previous on this issue] The military should identify all its resources and programs for reducing GHGs and responding to effects of climate change, update information continuously, forecast how it might be called upon for both mitigation and adaptation, and perform a gap analysis in anticipation of future requests. International discourse over climate change is increasing the development of international policies and strategies to mitigate and adapt to climate change.

Sources: (see an expanded list in the [Appendix](#))

May 2010 was warmest on record: U.S. government data

<http://www.reuters.com/article/idUSTRE65E63F20100616>

Climate Action Tracker

www.climateactiontracker.org

Food prices to rise by up to 40% over next decade, UN report warns

<http://www.guardian.co.uk/business/2010/jun/15/food-prices-rise-un-report>

Water Security Risk Index 2010

<http://maplecroft.com/about/news/water-security.html>

Dushanbe Meeting website

<http://waterconference2010.tj>

Vision 2030: The resilience of water supply and sanitation in the face of climate change:

http://www.who.int/water_sanitation_health/publications/9789241598422_cdrom/en/index.html

The international forum on GHG reduction analysis models

<http://www.korea.net/news.do?mode=detail&guid=47926>

Defense Experts Want More Explicit Climate Models

<http://www.nytimes.com/cwire/2010/06/24/24climatewire-defense-experts-want-more-explicit-climate-m-35887.html>

World Congress on Cities and Adaptation to Climate Change website

<http://resilient-cities.iclei.org/bonn2010/home/>

Summary of the Bonn Climate Change Talks: 31 May - 11 June 2010

<http://www.iisd.ca/download/pdf/enb12472e.pdf>

Energy Subsidies: Getting the Prices Right

http://www.iea.org/files/energy_subsidies.pdf

6.11 Nanotechnology Safety Issues

More detailed descriptions of the following nanotechnology issues are in the [Appendix](#)

- German Body Advises against Nanosilver in Consumer Products ([more](#))
- French Group Opens Public Web Site on Nanotechnology ([more](#))
- National Nanotech Regulation Experts Discuss Emerging Issues ([more](#))
- EU Restrictions on Nanofoods Expected to Pass in July ([more](#))

APPENDIX

Reference Details

This Appendix contains expanded background information on some items.

Item 6. Updates on Previously Identified Issues

6.10 Climate Change

Sources: (a more expanded list)

6.10.1 Scientific Evidence and Natural Disasters

May 2010 was warmest on record: U.S. government data

<http://www.reuters.com/article/idUSTRE65E63F20100616>

Climate Action Tracker

www.climateactiontracker.org

6.10.2 Food and Water Security

Food prices to rise by up to 40% over next decade, UN report warns

<http://www.guardian.co.uk/business/2010/jun/15/food-prices-rise-un-report>

Water Security Risk Index 2010

<http://maplecroft.com/about/news/water-security.html>

Dushanbe Meeting website

<http://waterconference2010.tj>

The Dushanbe Declaration

http://waterconference2010.tj/docs/Dushanbe_Declaration_09-06-2010.pdf

Vision 2030: The resilience of water supply and sanitation in the face of climate change:

http://www.who.int/water_sanitation_health/publications/9789241598422_cdrom/en/index.html

6.10.3 Computer Modeling

The international forum on GHG reduction analysis models

<http://www.korea.net/news.do?mode=detail&guid=47926>

Defense Experts Want More Explicit Climate Models

<http://www.nytimes.com/cwire/2010/06/24/24climatewire-defense-experts-want-more-explicit-climate-m-35887.html>

6.10.4 Adaptation

EU Press Release:

http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/envir/115143.pdf

Conclusion on Water Security:

<http://register.consilium.europa.eu/pdf/en/10/st10/st10497.en10.pdf>

World Congress on Cities and Adaptation to Climate Change website

<http://resilient-cities.iclei.org/bonn2010/home/>

World Congress on Cities and Adaptation to Climate Change--Session on food security

<http://resilient-cities.iclei.org/bonn2010/program/sunday-30-may/parallel-sessions-g/#c259>

6.10.5 Post-Copenhagen Negotiations

Summary of the Bonn Climate Change Talks: 31 May - 11 June 2010

<http://www.iisd.ca/download/pdf/enb12472e.pdf>

Summary of the Bonn Climate Change Talks 31 May - 11 June 2010

<http://www.iisd.ca/vol12/enb12472e.html>

Critics slam new climate change proposal in Bonn

<http://www.google.com/hostednews/ap/article/ALeqM5i9TuMrvrknh-ZXwqmZ2N-48kff3wD9G98TK01>

Rage, Dismay, and Disappointment as Climate Meeting Comes to a Close

<http://ictsd.org/i/news/biores/77872/>

Report of the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol on its twelfth session, held in Bonn from 1 to 11 June 2010

http://unfccc.int/documentation/documents/advanced_search/items/3594.php?such=j&last_days=60&dat_no=j#beg

Energy Subsidies: Getting the Prices Right

http://www.iea.org/files/energy_subsidies.pdf

6.11 Nanotechnology Safety Issues

More detailed descriptions of the nanotechnology issues

6.11.1 German Body Advises against Nanosilver in Consumer Products

The Federal Institute for Risk Assessment (BfR), of the German Federal Ministry of Food, Agriculture and Consumer Protection (BMELV), is advising against the use of nanoscale silver ions in consumer products until a definitive safety assessment is available.

Military Implications:

Military personnel concerned with nanotech risk assessment should add this finding to their store of existing opinion on the hazards of this material.

Sources:

Nanosilver has no place in food, textiles or cosmetics

<http://www.bfr.bund.de/cd/50960>

Nanosilver Has No Place in Food, Textiles or Cosmetics

<http://www.bfr.bund.de/cd/50960>

6.11.2 French Group Opens Public Web Site on Nanotechnology

The Citizen Alliance on the ChallEnges of Nanotechnologies (CACEN) (in French "Alliance Citoyenne sur les Enjeux des Nanotechnologies": ACEN) has opened a new (French language)

website <nano.acen-cacen.org> where citizens can find and share information, questions, and analyses about societal issues raised by nanotechnologies.

Military Implications:

It would be useful for a French-speaking military representative to monitor this site to gain an appreciation of the public mood toward nanotechnology in this part of Europe.

Source:

ACEN launches collaborative website on societal issues raised by nanotechnology

<http://www.nanowerk.com/news/newsid=16756.php>

Web site: <http://nano.acen-cacen.org>

6.11.3 National Nanotech Regulation Experts Discuss Emerging Issues

An interview with three key figures on emerging issues in nanotechnology regulation in the U.S. presents an overview of the nanotech-regulations situation in the U.S., notes that interest in evaluating the potential health and environmental risks of nanotechnology is growing, and reveals a high consensus that reasonable nanotech-regulations would be beneficial for the industry as well as for society. The article is the result of interview with Dr. Jeff Wong, Chief Scientist at the California Department of Toxic Substances Control (DTSC); Bill Gulleedge, Managing Director of the American Chemistry Counsel (ACC)'s Chemical Products & Technology Division and Chair of the ACC Nanotechnology Panel; and Tom Jacob, former DuPont Manager of Government Affairs for the Western Region and currently of T.R. Jacobs & Associates, LLP.

Military Implications:

Military personnel concerned with nanotech regulation should review this material for insights on current thinking in the regulatory field.

Source:

National leaders sound off on emerging nanotechnology regulation

<http://www.plantservices.com/articles/2010/06NanotechnologyRegulation.html?page=full>

6.11.4 EU Restrictions on Nanofoods Expected to Pass in July

The Committee on Environment, Health and Consumer Protection of the European Parliament has voted (42-2-3) in favor of excluding products containing nanoparticles from the EU list of novel foods allowed on the market. The action also included a declaration that food produced from nanotechnology processes must undergo risk assessment before being approved for use and must be labeled on packaging. A final plenary vote on the measure is expected to take place in the European Parliament in July.

Military Implications:

This action by the EU should serve as a further warning to the military to expect nanotech product restrictions to be enacted in jurisdictions worldwide, and to be prepared to adjust procurement plans accordingly.

Source:

U.S. should follow Europe and put the brakes on nanotech food and other products

<http://www.grist.org/article/food-opinion-US-should-follow-Europe-and-put-the-brakes-on-nanotech-food>